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ABSTRACT

Although improved teaching methods, materials, and technology probably have made university graphics instruction better today than ever before, students need to become more aware of ways in which they can provide cost-effective design to companies and organizations interested in getting maximum value from printing budgets. Such printing economies begin with concepts and objectives for the printed piece and continue through the choices for its design, format, paper, production, and printing contract. Graphic designers are more valuable to their employers and clients when they understand that savings are generated by intelligent methods of selecting and buying paper, typesetting, art, and color materials; and college professors can help develop such graphic designers by encouraging more student attention to economical design.
(Author/RL)

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# DESIGNING THE BOTTOM LINE:

## An Analysis of Printing Economies For the Responsible Graphics Communicator

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Presented to the Graphics Division,
Association for Education in Journalism Annual
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Graphics Division

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ABSTRACT

Because of greatly improved teaching methods, materials, and technology, university graphics instruction probably is better today than ever before. However, students need to become more aware of ways in which they can provide cost-effective design to companies and organizations more concerned today about getting maximum value from printing budgets.

Printing economies begin with concepts and objectives for the printed piece and continue through the choices for its design and format, paper, production, and printing contract.

Understanding savings generated from intelligent selecting and buying of paper, typesetting, art, and color can make graphic designers more valuable to their employers and clients. Graphics professors can help by encouraging more awareness of and practice in economical design.

Presented to the Graphics Division,
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## Introduction

Most of the more than seventy thousand college students studying in schools and departments of journalism or communications are exposed, in one way or another, to instruction in graphics. Recognizing the growing importance of visual literacy in today's mass media, graphics-oriented faculty members in journalism, public relations, advertising, and related areas have led a largely successful fight for improved teaching materials, technologically sophisticated equipment, and a respectful retirement of the California job case.

Graphics programs today are characterized by superior instruction in contemporary design principles, use of graphics materials, advanced phototypesetting methods, and publication of professional quality newspaper, advertising, and public relations materials. It seems safe to say, in short, that graphics instruction has never been better.

Unfortunately, as university graphics education today stands at its zenith alongside the $52 billion graphic arts industry (5:p.35), the nation's economy continues to falter. Predictions of unchecked inflation into the 1980s point to the need for renewed attention on the part of those charged with designing and buying printing to be doing so in the most economical manner possible. Much of this attention can be focused by college and university graphics professors. While most are aware of and

probably teach numerous budget-conscious principles, they usually find it more exciting and fulfilling to stress aspects of letterhead, corporate identity, brochure, advertising and newspaper design, technology, and use of materials that inspire creativity and independence in students without undue concern for cost.

One can easily forget that frugality is part of the heritage of printing and publishing. "Graphic art developed for economic--rather than aesthetic--reasons," states Edmund C. Arnold, respected author, editor and designer. "Demands for multiple copies [of printed matter] required not only fast but economical production" (1:p.327).

Lithography might never have been discovered if Alois Senefelder could have afforded expensive engraving copper for printing his plays rather than being forced to practice his technique on a stone slab. (17:p.26).

Perhaps the most famous printer of them all, Ben Franklin, was first and last a thrifty man. "Ben would be shocked and dismayed," states a paper manufacturer's booklet on printing economy, "if he could see how much unnecessary waste there is today in the planning and purchasing of printing." (7:p.3).

The intent here is not to argue a "penny-wise, pound-foolish" philosophy in considering the costs of print graphics to the detriment of creativity or quality. It is, however, to remind graphics students and professors alike that companies, newspapers, and other organizations with which they might work are becoming increasingly more sophisticated in their demands for good graphics

at a competitive price, and to point out specific ways to help meet those demands.

Concepts and Objectives for the Printed Piece

A beginning designer, new to the art of purchasing printing, might well ask his client: "Is this job really necessary?" (1:p.309). Many companies and government agencies offer incentives for design of cost-effective combinations of printed forms or their elimination altogether. Much could be saved by a designer helping with the simple decision not to print at all.

However, since most printed matter probably fulfills some useful function, the task then becomes one of planning to meet the objectives of the printed piece efficiently and economically. Behavioral objectives, stated in specific language and related to measurable responses are useful: e.g., "Upon distribution of 10,000 copies of this brochure to target audience A in September, 1979, at least 3 percent of those receiving it will respond by return order within 30 days."

Even if no specific, written objectives have been determined for a piece of printing, it may serve well if at least the following questions are addressed intelligently (6:p.10):

1. What is this piece supposed to accomplish?
2. What type of reader am I appealing to?
3. What "tone" (degree of quality, sophistication, or sales approach) do I want?
4. What style (photographic or typographic) should I use?
5. Are the format, quantity, unit cost, and paper appropriate?

One new "Graphic Cyclopedia" lists three simple questions that could promote cost effective design in any printed piece (6:p.3):

1. If I received this printed piece, would I be tempted to read it?
2. If I read it, what impression would I gain?
3. What, if anything, would I do?

Cost-Conscious Design

Selection of general design and format is at the heart of printing economy. Determination of objectives for each printed piece before such choices are made will prevent an often nebulous criterion -- "creativity" -- from becoming the only determinant of these elements.

Printers readily admit that design award plaques on their walls won't necessarily put bread on their customers' tables. Printers counsel that a careful look at all available design options for each piece of printing is wise, and allows the savings produced to be applied to those "price-is-no-object" jobs.

Economies can be deceptively simple. For example, designers who fail to consult a table of standard sizes in planning a brochure may find themselves ordering expensive oversized envelopes in which to mail them. Most designers know that bleeds are effective when used well but they may never have asked themselves whether or not the necessary extra trim afforded by a 38" x 50" sheet versus a standard 35" x 45" sheet for a 32-page, 8½" x 11" booklet is worth the 15 percent extra cost (17:p.348).

A slightly smaller booklet -- bled on a 35" x 45" sheet and trimmed out at 8 1/4" x 10 3/4" -- is perfectly suitable, and effects substantial savings.

Paper distributors routinely furnish designers with paper price books, many of which list paper sizes not generally realized to be available. For example, Warren Paper Company's popular 70 lb. Flokote book is sold in seven sizes by one large distributor (18:Sec.5, p.27), allowing design variety without waste.

Format may be as important to cost savings as finished size. For example, a folder requires neither the stitching nor trimming a brochure or booklet does. If that folder is planned for parallel folds, the job can be gang folded as well, rather than requiring pre-cutting and one-up folding -- a further savings. (8:p.42).

Good layout is an investment which provides "double insurance" against production waste and poor design. (8:p.21). Designers should be careful not to allow layout-forced expenses -- including too-critical registration, fancy irregular halftones, reverses in process color, and multiple screens and plate burns -- to waste client dollars.

Detailed, full-size roughs or comprehensive layouts, with thorough instructions expressed in printing terminology and accompanied by a folded dummy, can best assure that all production steps will be done efficiently and economically. Camera-ready art should be clearly marked in non-reproduction blue, and a translucent parchment overlay can contain many additional clarifying instructions that prevent costly misinterpretations.

Paper -- An Important Cost Variable

Paper selected for a printed piece is fundamental to the design process. In addition to size and quantity needed, characteristics including color, weight, finish, grain and opacity must be specified, and each decision affects price.

Printers have long cited the "one-third" formula for roughly estimating the cost of a printed job -- that is, about one-third of the cost of many printed pieces is accounted for by paper. While this estimate can be misleading, especially on short runs, it does indicate how important paper choices might be to the price of the finished piece.

One of the most critical decisions to be made by a designer regarding paper is that of quantity: is the number of pieces ordered based upon realistic needs, not arbitrary figures reflecting past orders or "questimations?" Normally, because of fixed costs -- design, art, typesetting, plates, and makeready -- the larger the press run the lower the unit cost. However, outdated, warehoused extra copies are no good to anyone but a paper recycler.

Depending upon how many sheets are needed for the job, printers usually can order paper most efficiently in standard lots. Paper can be bought in standard broken-carton, 1-carton, 4-carton, 16-carton, and up to a boxcar and larger quantities from the paper mill or its distributor. On special paper orders, it is wise for the designer to know how quantities ordered affect printers' price breaks. Consider, for example, that a dull-coated book stock, in a 23" x 35" size, costs about $150 per thousand sheets at the

broken-carton rate, but only $106 at the 1-carton price. Therefore paper for an order of 2M, 8½" x 11", 8-page folders (sold at 1,100 sheets to the carton, 2 out of a sheet, waste included) would cost the printer about 30 percent less per thousand sheets than would the exact same grade of paper for an order of only 1 M folders where paper was ordered at a broken-carton rate.

Most printers do not mind discussing the most economical buying quantities with customers, and can suggest many ways to tailor quantities to budgets. Designers can save substantially by often designating the use of popular papers regularly bought in large quantities by the printer.

One question a printer might ask is whether or not a certain job can be "ganged up" on the same paper with another, thereby saving on plates, press time and bindery. Many companies order similar pieces which logically could be printed in the same run with a little planning.

Often beginning graphic designers accept too literally certain "rules" they have heard about paper use. For instance, some think that all coated stocks are more expensive than uncoated papers. This ignores the fact that manufacturers produce many top-of-the-line uncoated stocks quite superior to coated stocks for special applications such as blind embossing. Many pigmented (matte-coated) papers, which are smoother and look more expensive, may be as much as 25 percent cheaper than these high quality uncoated papers. The receptivity of matte-coated papers to halftones up to 133 lines makes them a real bargain if four-color process is

not required.

Less expensive uncoated papers can be ideal where art not requiring fine detail is used, especially when printed in soft, pastel hues. Poor formation (uneven distribution of fibers) in these stocks, however, can be quite destructive of halftones, since ink tends to soak into the sheet unevenly. Here, as in many other instances, economy must be balanced against minimum quality acceptable. In this case, either a high grade uncoated paper should be selected, or halftones should be eliminated.

Light-weight papers can save from 5 to 50 percent of paper cost (11:p.121), and that is only the beginning. Storage, production, shipping, and mailing costs probably will be trimmed as well. A printer should be consulted about these papers, however, since they generally cost more per pound and can cause printing problems on sheet-fed presses. Both printed and unprinted opacity also should be checked on all thin papers, since "showthrough" can ruin an otherwise cost-effective piece (2:p.131). The U. S. Postal Service now requires a minimum 7-point thickness for self-return cards, so thicker stocks should be used.

While colored bond is roughly 5 percent more expensive than white, color coding of printed forms can make filing, sorting, and distributing so much easier that the slight difference in paper cost may be recovered easily in saved labor (1:p.310).

Some designers save substantially by ordering large quantities of paper directly from the paper distributor, even the mill, and furnishing it to the printer as needed. Printing Trade

Custom #15, one of 17 reaffirmed by the National Association of Printers and Lithographers recently, states that all "customer-furnished materials shall be manufactured, packed and delivered to the printer's specifications . . ." (14:p.63). The customer must absorb any costs of delays or impaired production. Therefore, special care must be taken to see that furnished paper conforms to the printer's individual requirements. Some designers who furnish their own paper forget, too, that numerous color runs, die-cutting, complicated folding, and other factors can drive spoilage up beyond 25 percent, depending upon the quantity ordered. Causing a four-color press to stand idle (at perhaps $80 an hour) while more paper is delivered to the plant in order to complete a job is a quick way for a designer to negate all previous efforts at economy.

Production Economies

While general design and paper selection probably account for the largest savings a graphics communicator realizes, numerous production costs can be kept under control. These include:

(a) Typesetting. An important first rule for obtaining reasonable typesetting prices is that one furnish clean, error-free, carefully edited copy. Trade custom calls for estimates based on " . . . manuscript clearly typed, double-spaced on 8½" x 11" uncoated stock, one side only." (12:p.68). Two highly expensive mistakes far too many persons make are failing to make all corrections on the manuscript instead of the proof, and neglecting to copyfit a manuscript prior to its setting. "These two rules are

probably violated more often than any other by buyers of printing," says one paper manufacturer. "Every violation is a waste of money." (8:p.18).

Costs of "author's alterations" may run between $15 and $25 per hour, and a $2 charge per stripped-in line on a negative is not uncommon. Obviously, a budget can be devasted by unnecessarily wasteful editing and proofing procedures.

Anyone planning to have type set should question whether or not the quality of typesetting is appropriate for the job. Many typesetters offer several levels of quality -- roughly equivalent to ordinary, medium, or excellent -- at increasing costs per square inches, 1,000 ems, pages, keystrokes, or hours. A one-color folder may not require the 50 percent to 100 percent increased cost of complete uniformity in spacing and hyphenation that excellent quality setting for a four-color brochure demands (4:p.2).

Run-arounds, type mortises, inset initials, tabular work, and other unusual typesetting modes often add substantially to normal per-page cost, computed recently as averaging $30 for a high-density, 8,000-character, 8½" x 11" magazine format (9:p.50).

(b) Photographs and art. One of the best known principles of obtaining high quality in a finished printed piece is that of furnishing the best original possible. Since art or photographs often account for less than 15 percent of total cost, one is usually wise to get the best available. Poor photography and art cannot help a piece meet its objectives, and may cause the entire design effort to be wasted. However, this does not rule out

considerable savings for the designer who knows, for example, that continuous-tone, black and white originals can be shot together without loss of quality if their tonal values are the same, and if they can be exposed at the same process camera focus. Careful instructions to the photographer are necessary, of course, before shooting and printing is done on the originals.

Line art usually should be drawn about 150 to 200 percent of desired finished size, in black ink on smooth white board. The little money saved on same-size art pre-pasted on camera-ready flats is not worth the loss of image sharpness that reduction can prevent.

A designer with access to a quality process camera can save much expensive labor by doing both line and halftone work in-house. One should realize, however, that a halftone paper positive (PMT) screened at a coarse 85 lines may be no bargain when printed on a gloss-coated paper capable of reproducing 150-200 lines with ease. When fine detail is required, and fine paper is being used, film negatives should be prepared, usually at the now standard 150 dots per inch, and these should be stripped for direct burning to the plate.

(c) Use of color. Perhaps the simplest money-saving combination of ink and paper is the monochromatic scheme with colored ink on a matching colored paper -- dark brown ink on light brown paper, for example. By using a number of screen tints in the design, one can easily produce a multi-color effect with little increased cost. Two-tone "duplex" papers, bright opaque inks, and unusual halftone screens -- all used judiciously -- can heighten the impact

of a very reasonably priced piece of printing.

Designers should consider furnishing their own color materials when possible. Mechanical separations of art, employing the popular red or amber stripping films widely available, can be done by the designer in most cases, thereby saving the expense of a printer's art service. Where circles, round corners, and other effects will be film cut, however, the printer most likely will have better tools and more experience to perform such tasks.

Most four-color separations today are produced on electronic or laser scanners, and specialty houses offer work of high quality at prices sometimes less than a regular printer might have to charge. Rates average from roughly $5 a square inch for small sizes to about $1 for very large sizes (4:p.4). However, rates vary so widely due to the intense competition in this specialty that one is well advised to seek several quotations from reputable separators.

While printers are quite used to and often welcome customer-furnished color separations, designers should help protect the quality of their finished printing by (1) selecting the appropriate dots-per-inch screening for the printing process, paper and printer selected; and (2) requesting that the separator obtain the densitometer readings generally preferred by the printer being used so that dot densities can be properly controlled in the separation process.

The new laser scanners are capable of a wide range of local and area color correction, formerly done only through highly expensive hand and chemical etching. They can produce 300-line

dot formations, and can work from 35-mm. transparencies (or anything else that can be wrapped around the drum), but medium-format and larger slides still yield the sharpest results. If 35-mm. format is used in order to save money, one should be certain the color saturation is good and that the image is quite sharp.

Selecting the Right Printer

From the some 40,000 printing plants that make up the commercial segment of the industry (5:p.35), how does one choose those printers which offer the best job at the best price? There is no real substitute for experience with a number of printers. Seventy-five percent of the 250 buyers of printing surveyed last year for the PICA/Dillard Graphics Management Institute listed "reputation" and "sales calls" as the leading methods that acquaint them with new printers, while more than half of those responding said they also conduct their own investigations. "Dependability," "quality control," "careful handling of details," and "high quality personnel" all were rated "essential" by more than 67 percent of those responding. While only 9 percent rated "low prices" as "essential," fully 33 percent rated this item "important" (3:p.48).

Knowledge of printers' specialities is essential to proper selection of those with which one will work. One printer may be best equipped for small-run, one-color "job work"; another might thrive on medium-run, 2-color brochures and folders; and still another might specialize in quality four-color work of medium to large runs due to the larger 2- and 4-color presses he has available. Art, bindery and mailing services vary widely among printers.

Of those printing buyers responding to the PICA/Dillard survey, 62.2 percent said they regularly deal with from four to six printers, and about the same number normally required estimates from at least three.

One key, then, to competitive quotes is selecting the right group of printers from which to seek those quotes. Generally, the less "buying out" (subcontracting) the printer is forced to do, the greater the savings. However, items such as thermographed business cards and engraved invitations are normally bought from speciality houses which sell to the printer at very competitive prices.

Seeking the Quotation

The wise graphic designer almost invariably seeks a firm quotation on all printing ordered. It is not unheard of for printers, especially smaller ones doing jobs outside of their usual specialties, to encounter unforseen problems and delays that drive up production costs. Therefore, a customer's protection from such add-on costs is a firm quotation obtained in advance of work being performed.

"Quoting is basically a means of articulating an agreement on specifications and price of the product between printer and customer," says Wallace Stettinius, award-winning printing management author (15:p.200). Printing is "custom designed and engineered," he adds, and therefore requires pricing based upon a number of individualized variables.

Stettinius cites three generally traditional types of quotes:

(1) lump sum pricing -- the most common method, and rather inflexible; (2) open pricing (cost plus) -- a "blank check" approach that allows a printer to figure total cost for the job, then add a reasonable profit; and (3) process quoting -- the figuring of time required for each step in production of a job plus cost of material (15:p.201). Because each time unit (often based upon a system of 10 6-minute units per hour) is priced differently for each production step, this method often is difficult for a customer to understand.

Stettinius argues that the most valuable type of quotation is based upon "product modules." This method of quoting identifies and puts a price on individual components of a job -- halftones, pages of composition, proofs, strip ins, plate burns, even additional per-thousand quantities beyond the original order.

> Most customers find fault with [the three traditional approaches] because they don't solve the customer's biggest problem -- that of understanding the economies of manufacturing the job so he can make appropriate value judgments. . . .
> . . . [and without sufficient information] he cannot get maxiumum value for his limited dollar because he cannot know the incremental cost of his design alternatives (15:p.202).

The author states that "product module" quotes are so popular and helpful to customers that printers are now using them as marketing tools to compete for printing.

A great variety of pricing systems exist today (16), including those depending upon standard price lists, what the market will bear, even "guesswork." (10:pp.140-20). Therefore, the graphic designer is well advised to compare carefully

the quoting systems he observes and to insist upon the detail provided by systems similar to "product module" quotes, in order to be able to pre-plan each job precisely to its budget.

A designer should be reminded that quotations age quickly in times of paper strikes and rapidly escalating labor and materials costs. Trade Custom #1 states that "Quotes not accepted within 30 days are subject to review." (12:p.68).

Quotations should contain every applicable cost ranging from early experimental art and layout done by the printer, if necessary, to delivery of the finished work. One can even negotiate reprint prices and have them built into the quote to prevent misunderstandings later, although not all printers like to chance quoting a price on reprinting which might be unreasonably low by the time the customer exercises the option. Reprint quotes virtually guarantee careful filing and storage of negatives, flats, sometimes even plates, by the printer. However, trade custom does maintain printer ownership of such materials unless other written agreements are made in advance.

Two items sometimes appearing in the fine print of quotation forms should be discussed with the printer: (1) the "escalator" clause, which applies to long-term contracts for regular publications such as magazines, and (2) "over- or under-run" provisions, which allow more or less than the customer ordered to fulfill an agreement.

The "escalator" describes conditions, such as paper availability or fluctuations in general market conditions that might

cause a quoted price to be raised during the term of the contract. This would rarely present problems to the designer who contracts mostly short duration work.

A provision which allows a 10 percent variation, above or below, an ordered quantity is often stated in a printing contract and is protected by trade custom. While technically an over- or under-run job constitutes an "acceptable delivery," most printers are not foolish enough to jeopardize customer relations with such practices. However, since an overage protentially could increase costs, and an under-run delivery could cause disaster if a minimum number of pieces were required to fill an important mailing list, the designer should be certain the printer understands what actually constitutes an acceptable delivery.

Oddly enough, there are even a few advantages to not requiring a quotation on every job, especially if a single, trusted printer is used frequently. Savings from lower sales costs of such jobs can be passed on by the printer, along with the good service and "protection" of company standards and image afforded a favored customer. (8:p.15). Printers have been known to ease the pain of a serious proofreading error by reprinting a job at cost if the hapless designer has been easy to deal with in the past.

People in the printing industry have their own "black lists" of "poor customer" characteristics which add substantially to such customers' printing bills. (10:p.70, and 8:p.9). Designers who are likely to receive "tempered" (higher) quotations exhibit

one or more of the following bad habits: they

1. always need their job yesterday,
2. provide poor or verbal specifications,
3. often ask for quotes, but rarely let the job,
4. provide poor copy,
5. use art that requires extensive touch-up,
6. require difficult color matches,
7. haggle prices excessively,
8. deliver material piecemeal to the printer,
9. constantly change copy, color, art, paper, or other specifications while work is in process.

Since all of the above only slow production and add unnecessarily to printing costs, all designers -- and especially those just beginning to form their working relationships with printing firms -- should avoid such practices.

The Bottom Line

It appears that, from this brief discussion of many variables that affect the cost of what graphic designers finally see as the finished printed piece, opportunities abound for reconciling quality of design with sensible savings for a customer. Professors can help raise the cost consciousness of students by asking them, at least on one assignment, either to obtain a printing quotation on the job, or to figure the cost themselves from standard price books such as Porte Publishing Company's Franklin Offset Catalog. Perhaps a local estimator can be found who will come into class for a session and provide rapid

quotes on different student projects, explaining the steps as the class observes. This would avoid having scores of students descend upon local printers requesting "dummy" quotes.

If attitudes favorable to helping maximize clients' printing investments are encouraged in students, these beginning graphic designers more than likely will become more valuable to their employers and clients. This can only be positive for their professional careers and personal satisfactions.

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